

OFFICE OF TECHNOLOGY COMMERCIALIZATION

DIVISION OF RESEARCH & SCHOLARLY ACTIVITIES
PURDUE RESEARCH FOUNDATION - PURDUE UNIVERSITY

64281

INVENTION RECORD AND DISCLOSURE CONFIDENTIAL

NOTE: This form requires the signatures of: Department Head(s) and School Dean(s). Please complete the attached form and then route to Department Head(s), Dean(s) and then back to the Office of Technology Commercialization (OTC), 1291 Cumberland Avenue, Suite F, West Lafayette, IN 47906 (Note: Please feel free to add additional attachments to elaborate on any questions, or to call the Office of Technology Commercialization at 42610 for assistance).

I. Formal Record of Disclosure

Please identify by name, phone number, department and building, each individual who contributed to development of the proposed invention and who will share in any net proceeds from the proposed invention. Please note that individuals listed here may or may not qualify as legal inventors for patent applications. Type the name and campus address of your department (school) head and school dean and obtain signatures.

A. Disclosure Title: OPTIMIZED VERTICAL POWER DMOSFETS IN SILICON CARBIDE

B. Disclosure Date: 12-19-04

C. Full legal names (including middle name) and titles of inventor/submitter(s) (Please print: Prof/Dr/Mr/Ms, followed by full legal name).

Title	Name (ALBERT)	Phone No.	Department	Building
PROF.	JAMES A. COOPER, JR	(b) (6)	ECE & BNC	EE EE
MS.	ASMITA SAHA		ECE & BNC	EE

D. Disclosure must be reviewed and approved by Submitter's Department Head and Dean

Department Head(s)

MARK J.T. SMITH, ECE

Signature
(b) (6)

Date

01/03/05

Comments:

Dean(s) of School

(b) (6)

Date

01/07/05

Comments:

II. Sponsorship

Please specify the source of funds that were used in the research that led to the technology, including contract number from which salaries and other project costs were paid, which resulted in the disclosure. This information is critical for correct identification of sponsors and meeting obligations to them.

A. Government Agency/Address: DARPA/MTO
3701 NORTH FAIRFAX DRIVE
ARLINGTON, VA 22203-1714

Contract/Grant #: N00014-02-1-0628
Grant/Contract Title: DEVELOPMENT OF PROCESS
TECHNOLOGIES FOR HIGH-
PERFORMANCE MOS-BASED
SIC POWER SWITCHING DEVICES

B. Name of department, industry, foundation or other sponsor/Address:

Contract/Grant #:
Grant/Contract Title:

C. Has the invention been disclosed to industry representatives? If "yes" please provide details, including names of companies and their representatives and dates:

No

(b) (4)

(b) (4)

(b) (4)

**VIII. Marketing Summary of the Invention
(Non-confidential/Non-Technical Information)**

Please summarize the invention in terms such that its value can be understood by a potential licensee. This summary will be used for distribution to companies to determine commercial interest in the proposed invention. Please provide a one paragraph concise description. This summary must not allow one skilled in the art to practice the proposed invention.

a structure and method of fabrication of vertical DMOS power transistors in silicon carbide to achieve close to the minimum theoretical on-state resistance at a given blocking voltage.

IX. Technology Classification

Please classify the disclosed technology in as many of the following areas that you believe apply to the technology.

LIFE SCIENCE / BIOTECHNOLOGY

- ☐ Animals
- ☐ Biomedical (Specify)
 - ☐ Diagnostic
 - ☐ Therapeutic
- ☐ Dental
- ☐ Foods and Nutrition
- ☐ Health Sciences
- ☐ Medical Devices (Specify)
 - ☐ Diagnostic
 - ☐ Therapeutic
- ☐ Pharmaceutical (Specify)
 - ☐ Diagnostic
 - ☐ Therapeutic
- ☐ Plants
- ☐ Other (Specify)

PHYSICAL SCIENCE

- ☐ Automotive Engineering
- ☐ Chemical Science/Chemical Engineering
- ☐ Construction, related
- ☒ Electronics
- ☐ Energy
- ☐ Fluid Mechanics
- ☐ Manufacturing
- ☐ Materials
- ☐ Mechanical Engineering/Devices
- ☐ Separations
- ☐ Transportation
- ☐ Waste Treatment
- ☐ Other (Specify)

INFORMATION SCIENCE

- ☐ Computer Hardware (Specify)
 - ☐ Mainframe
 - ☐ UNIX
 - ☐ PC
- ☐ Computer Software
- ☐ Telecommunications
- ☐ Other (Specify)

EDUCATIONAL MATERIAL

- ☐ Printed and/or Artwork Material
- ☐ Software
- ☐ Videos
- ☐ Multimedia
- ☐ Other (Specify)
- OTHER (Specify)**

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Important Note: In order for you to continue receiving royalties for the life of the patent, we must have your forwarding address each time you move. Please keep us updated by sending forwarding address information to:

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Office of Technology Commercialization
1291 Cumberland Avenue, Suite F
West Lafayette IN 47906

If you have any questions, please call 765/494-2610.

INVENTOR/CREATOR

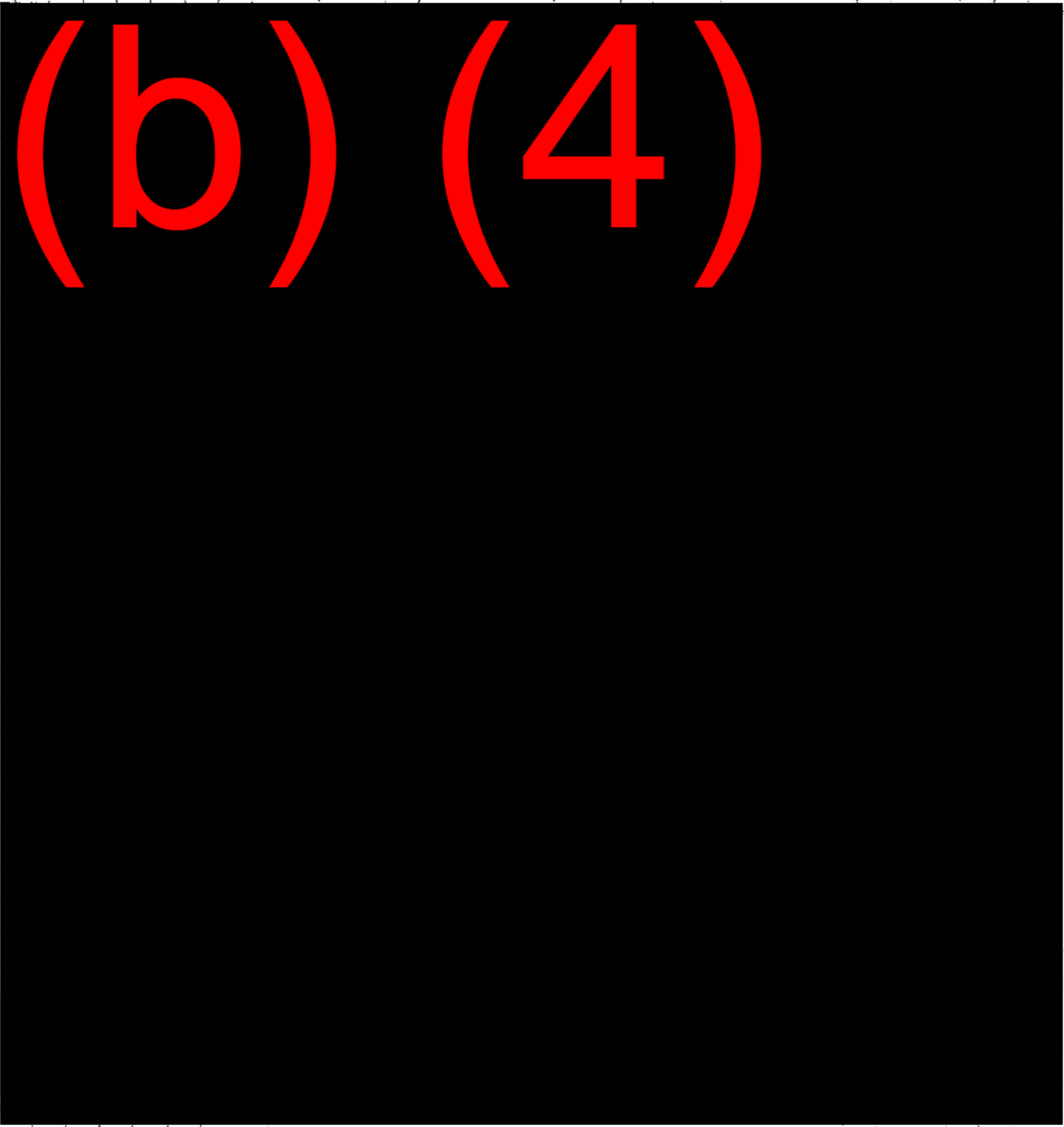
PROF.	JAMES	A.	COOPER
Title	First Name	Middle Initial	Last Name
465 NORTHWESTERN AVENUE		(b) (6)	
Work Address		Permanent Home Address	
WEST LAFAYETTE, IN 47907-2035		(b) (6)	
City, State, Zip, Country		City, State, Zip, Country	
(b) (6)		(b) (6)	
Work Phone Number		Home Phone Number	
(b) (6)		cooperj@purdue.edu	
Work Fax Number		E-Mail Address	
(b) (6)		(b) (6)	
Social Security Number		Citizenship	

INVENTOR/CREATOR

MS.	ASMITA		SAHA
Title	First Name	Middle Initial	Last Name
465 NORTHWESTERN AVENUE		(b) (6)	
Work Address		Permanent Home Address	
WEST LAFAYETTE, IN 47907-2035		(b) (6)	
City, State, Zip, Country		City, State, Zip, Country	
(b) (6)		(b) (6)	
Work Phone Number		Home Phone Number	
(b) (6)		(b) (6) @purdue.edu	
Work Fax Number		E-Mail Address	
(b) (6)		(b) (6)	
Social Security Number		Citizenship	

(b) (4)

(b) (4)



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A. Disclosure Title: HIGH-VOLTAGE N-CHANNEL INSULATED GATE BIPOLAR TRANSISTOR (IGBT) IN SILICON CARBIDE

B. Disclosure Date: DEC. 15, 2005

C. Full legal names (including middle name) and titles of inventor/submitter(s) (Please print: Prof/Dr/Mr/Ms, followed by full legal name).

Title	Name	Phone No.	Department	Building
PROF.	JAMES A. COOPER, JR.	(b) (6)	ECE & BNC	EE
MS.	XIAOKUN WANG	(b) (6)	ECE & BNC	EE

D. Disclosure must be reviewed and approved by Submitter's Department Head and Dean

Department Head(s)

MARK J. J. SMITH, ECE

Signature

(b) (6)

Date

01/03/05

Comments:

Dean(s) of School

(b) (6)

Date

01/10/05

Comments:

II. Sponsorship

Please specify the source of funds that were used in the research that led to the technology, including contract number from which salaries and other project costs were paid, which resulted in the disclosure. *This information is critical for correct identification of sponsors and meeting obligations to them.*

A. Government Agency/Address: DARPA/MTO
3701 NORTH FAIRFAX DRIVE
ARLINGTON, VA 22203-1714

Contract/Grant #: - N00014-02-1-0628
Grant/Contract Title: DEVELOPMENT OF PROCESS
TECHNOLOGIES FOR HIGH-PERFORMANCE
Contract/Grant #: MOS-BASED SIC POWER
Grant/Contract Title: SWITCHING DEVICES

C. Has the invention been disclosed to industry representatives? If "yes" please provide details, including names of companies and their representatives and dates:

NO

(b) (4)

(b) (4)

(b) (4)

VIII. Marketing Summary of the Invention (Non-confidential/Non-Technical Information)

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A method and process for fabricating high voltage (≥ 15 kV) n-channel IGBTs in silicon carbide (SiC). The procedure avoids the high resistance introduced by a P+ SiC substrate, while preserving the advantages of an n-type MOS channel.

IX. Technology Classification

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If you have any questions, please call 765/494-2610.

INVENTOR/CREATOR

PROF.	JAMES	A.	COOPER
Title	First Name	Middle Initial	Last Name
465 NORTHWESTERN AVENUE		(b) (6)	
Work Address		Permanent Home Address	
WEST LAFAYETTE, IN 47907-2035		(b) (6)	
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(b) (6)		(b) (6)	
Work Phone Number		Home Phone Number	
(b) (6)		coopers @ purdue. edu	
Work Fax Number		E-Mail Address	
(b) (6)		(b) (6)	
Social Security Number		Citizenship	

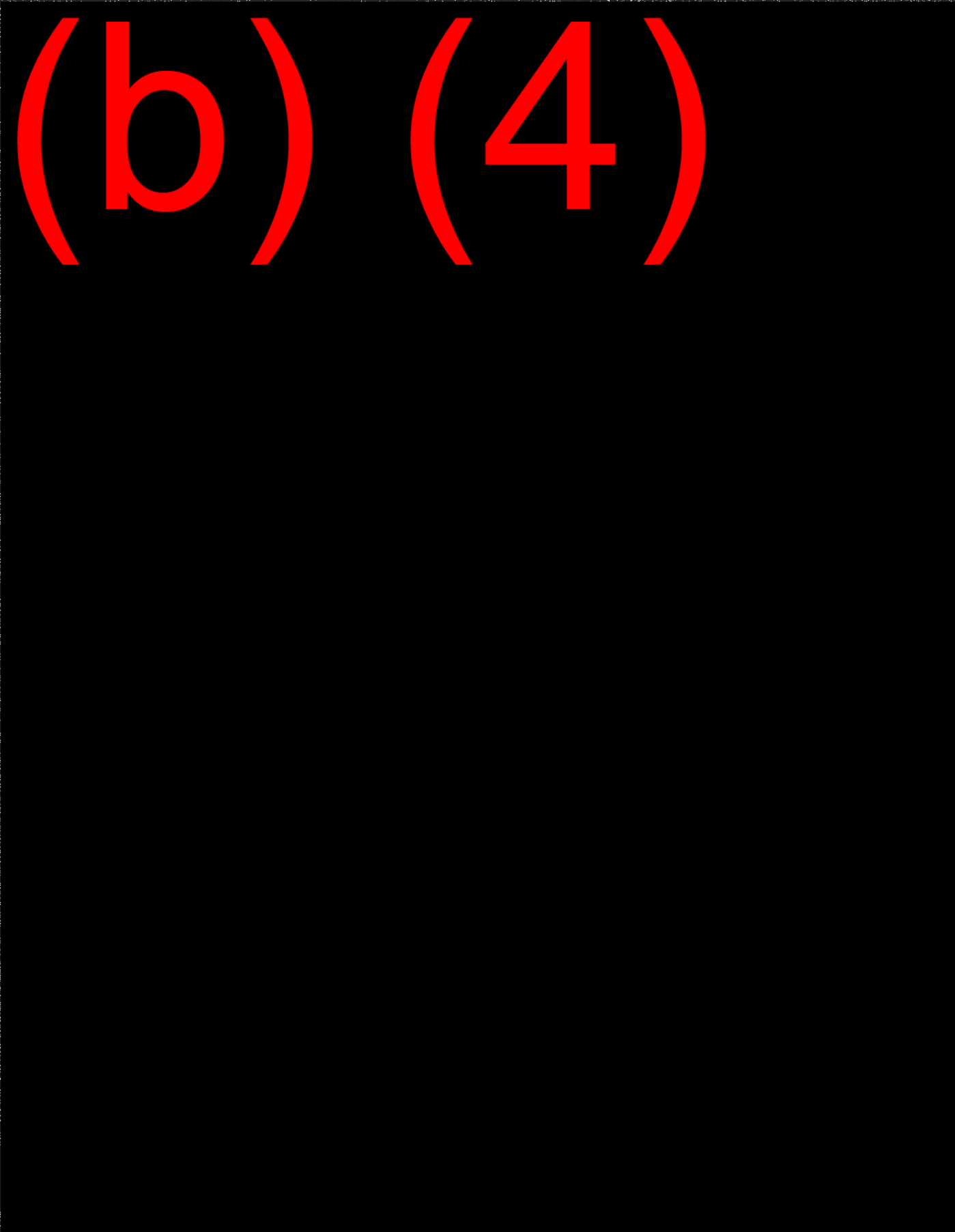
INVENTOR/CREATOR

MS.	XIAOKUN		WANG
Title	First Name	Middle Initial	Last Name
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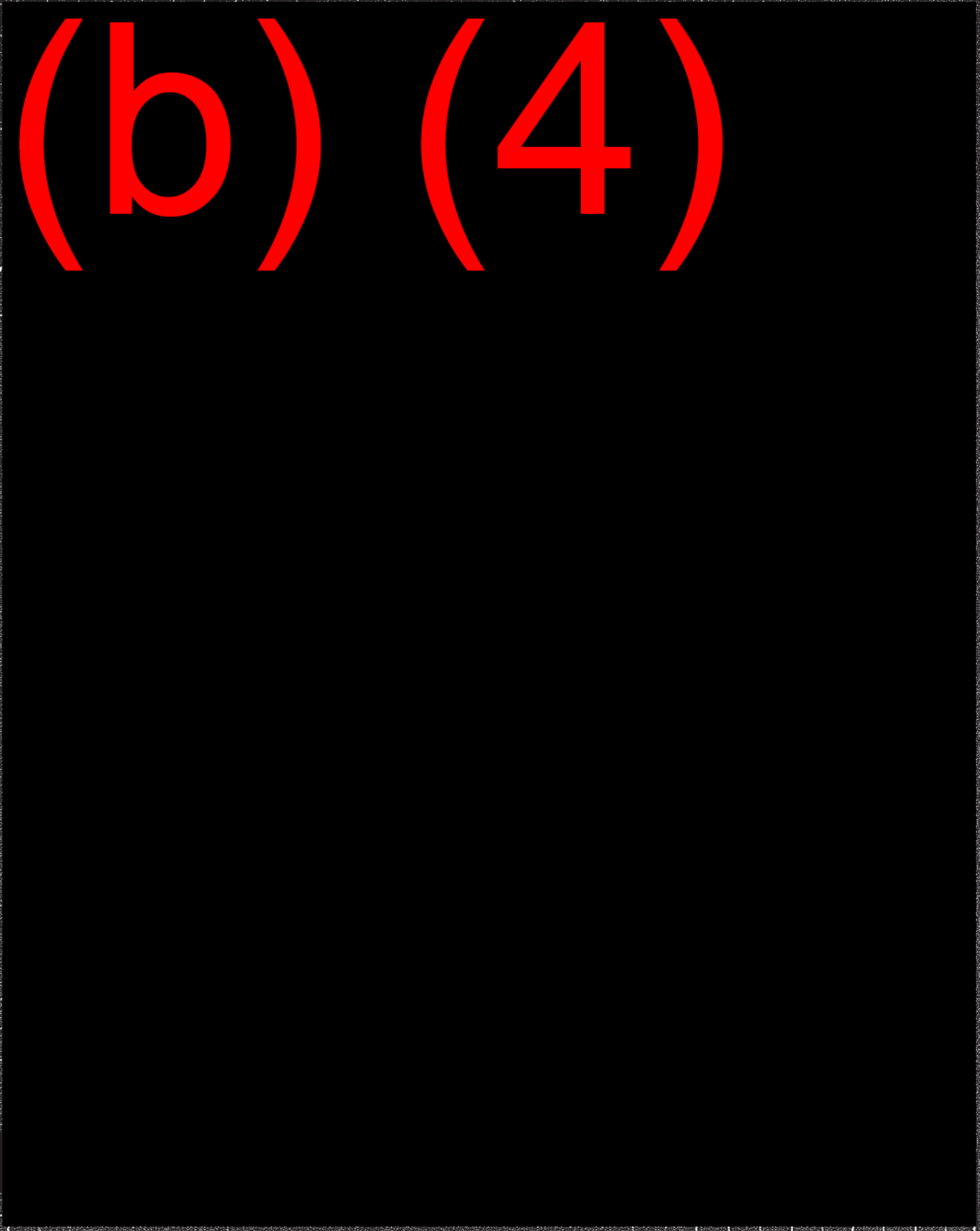
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 **COPY**

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A. Disclosure Title: FABRICATION PROCESS FOR MONOLITHIC CMOS INTEGRATED CIRCUITS ON THE SAME CHIP WITH VERTICAL ~~POWER~~ POWER TRANSISTORS

B. Disclosure Date: 12-19-04

C. Full legal names (including middle name) and titles of inventor/submitter(s) (Please print: Prof/Dr/Mr/Ms, followed by full legal name).

Title	Name	Phone No.	Department	Building
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MARK J. J. SMITH, ECE

(b) (6)

Date

01/05/05

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- B. Name of department, industry, foundation or other sponsor/Address:

N00014-02-1-0628
Contract/Grant #: DEVELOPMENT OF PROCESS
Grant/Contract Title: TECHNOLOGIES FOR HIGH-
PERFORMANCE MOS-BASED
Contract/Grant #: SiC POWER SWITCHING
Grant/Contract Title: DEVICE 5

- C. Has the invention been disclosed to industry representatives? If "yes" please provide details, including names of companies and their representatives and dates:

NO

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This invention describes a structure and method of fabrication for monolithic integration of CMOS integrated circuits on the same chip with vertical DMOS power transistors for smart-power applications.

IX. Technology Classification

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LIFE SCIENCE / BIOTECHNOLOGY

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INVENTOR/CREATOR

PROF.	J AMES	A.	COOPER
Title	First Name	Middle Initial	Last Name
465 NORTHWESTERN AVENUE		(b) (6)	
Work Address		Permanent Home Address	
WEST LAFAYETTE, IN 47907-2035		(b) (6)	
City, State, Zip, Country		City, State, Zip, Country	
(b) (6)		(b) (6)	
Work Phone Number		Home Phone Number	
(b) (6)		coopers@purdue.edu	
Work Fax Number		E-Mail Address	
(b) (6)		(b) (6)	
Social Security Number		Citizenship	

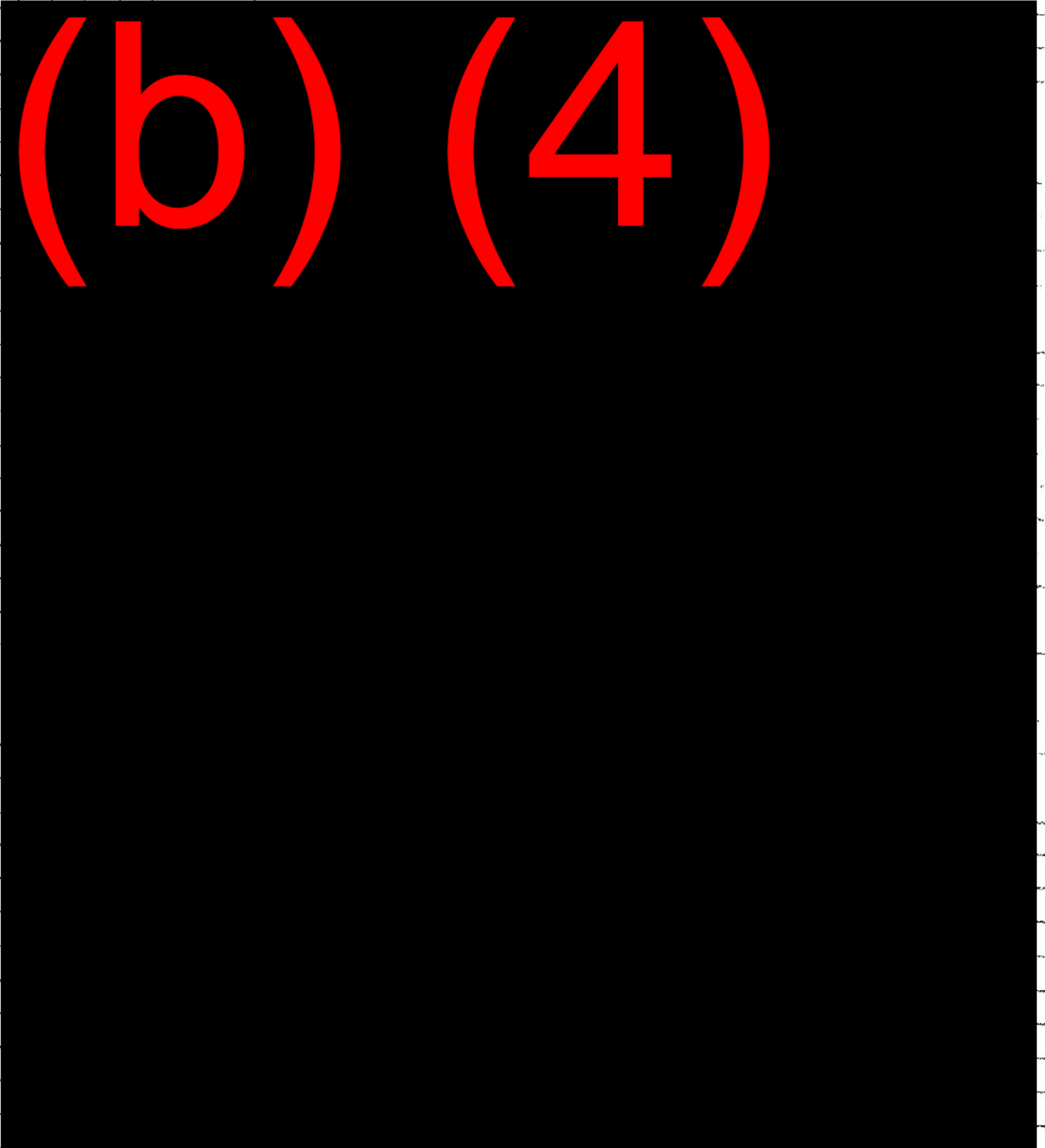
INVENTOR/CREATOR

Title	First Name	Middle Initial	Last Name
Work Address		Permanent Home Address	
City, State, Zip, Country		City, State, Zip, Country	
Work Phone Number		Home Phone Number	
Work Fax Number		E-Mail Address	
Social Security Number		Citizenship	

(b) (4)

(b) (4)

(b) (4)



PURDUE UNIVERSITY



SCHOOL OF ELECTRICAL
AND COMPUTER ENGINEERING

Date: 1-18-05

FACSIMILE TRANSMITTAL

TO:

NAME: HILTON TURNER

LOCATION: OTC

TELEPHONE: 496-7539 FAX: 496-1277

FROM:

NAME: JIM COOPER

LOCATION: ECE

TELEPHONE: (765) 494-3514 FAX: (765) 494-2706

Total number of pages (including cover): 2

Additional information:

Hilton-

*As we discussed, here's the
extension of case # 64279.*

(b) (6)

(b) (4)